

CLAIMS

What is claimed is:

1. An external blow-off conversion apparatus, for a turbocharger compressor having a compressor inlet, a compressor outlet, and a recirculation valve adapted for attachment to a valve mounting flange, the mounting flange defining a recirculation valve inlet port operatively connected in fluid communication to the compressor outlet and a recirculation valve outlet port operatively connected to the compressor inlet, the recirculation valve inlet and outlet ports selectively connectable to one another by the recirculation valve when the recirculation valve is operating in a recirculation mode, to thereby provide internal recirculation from the compressor outlet to the compressor inlet, and disconnected from one another by the recirculation valve when recirculation valve is not operating in the recirculation mode, to thereby block internal recirculation between the compressor inlet port and the compressor outlet port, the external blow-off apparatus comprising:

an external blow-off adaptor having a body configured for mounting between the recirculation valve and the valve mounting flange;

the body of the external blow-off adaptor defining an inlet passage providing fluid communication between the recirculation valve inlet port of the flange and the recirculation valve, a blow-off vent, and a blow-off passage providing fluid communication between the recirculation valve and the blow-off vent, and

a wall blocking fluid communication between the recirculation valve and the recirculation valve outlet port of the flange;

the wall and the blow-off passage of the body of the external blow-off adaptor blocking internal recirculation between the compressor inlet and outlet ports, and directing a flow of air from the recirculation valve to the blow-off vent when the recirculation valve is operating in the recirculation mode.

2. The external blow-off apparatus of claim 1, further comprising a recirculation valve controller adapted for operative connection to the recirculation valve for controlling the recirculation valve with the external blow-off adaptor installed between the recirculation valve and the valve mounting flange.

3. The external blow-off apparatus of claim 1 wherein the external blow-off adapter is configured for producing a desirable sound when the recirculation valve is operating in the recirculation mode.
4. The external blow-off apparatus of claim 1, further including a gasket adapted for installation between the adaptor and the valve mounting flange and including the wall.
5. The external blow-off apparatus of claim 1, wherein the wall is integral with the body.
6. The external blow-off apparatus of claim 1 wherein the body of the external blow-off adapter is a generally flat plate defining a thickness of the plate, a first planar surface adapted for bearing against the valve mounting flange, and a second planar surface adapted for receiving the recirculation valve, the first and second planar surfaces extending generally parallel to one another and spaced from one another by the thickness of the flat plate.
7. The external blow-off apparatus of claim 6, wherein:
the blow-off passage extends from the second planar surface into the plate and terminates in the wall of the body; and
the blow off vent extends from the blow-off passage and exits the plate between the first and second planar faces of the plate.
8. The external blow-off apparatus of claim 7, wherein the blow-off passage extends generally perpendicularly to the second planar surface into the thickness of the plate, and the blow-off vent extends transversely to the blow-off passage.
9. The external blow-off apparatus of claim 8, wherein the blow-off vent extends radially from the blow-off passage.
10. The external blow-off apparatus of claim 9, wherein the wall is integral with the body.

11. An external blow-off adaptor, for a turbocharger compressor internal recirculation valve configured for attachment to a valve mounting flange defining a recirculation valve inlet port operatively connected in fluid communication to an outlet of a turbocharger compressor and a recirculation valve outlet port operatively connected in fluid communication to an inlet of the turbocharger compressor, the recirculation valve inlet and outlet ports being selectively connectable to one another by the recirculation valve when the recirculation valve is operating in a recirculation mode, to thereby provide internal recirculation through the recirculation valve from the compressor outlet to the compressor inlet, and disconnected from one another by the recirculation valve when recirculation valve is not operating in the recirculation mode, to thereby block internal recirculation between the compressor outlet port and the compressor inlet port, the external blow-off adaptor comprising:

an adaptor body configured for mounting between the recirculation valve and the valve mounting flange;

the adaptor body defining an inlet passage providing fluid communication between the recirculation valve inlet port of the flange and the recirculation valve, a blow-off vent, and a blow-off passage providing fluid communication between the recirculation valve and the blow-off vent,

the blow-off passage of the body of the external blow-off adaptor thereby directing a flow of air from the recirculation valve to the blow-off vent when the recirculation valve is operating in the recirculation mode.

12. The external blow-off adaptor of claim 11, wherein the adaptor body further comprises a wall blocking fluid communication between the recirculation valve and the compressor outlet port of the flange, the wall thereby blocking internal recirculation between the compressor inlet and outlet ports, and directing a flow of air from the recirculation valve to the blow-off vent when the recirculation valve is operating in the recirculation mode.

13. The external blow-off adaptor of claim 11, wherein the external blow-off adapter is configured for producing a desirable sound when the recirculation valve is operating in the recirculation mode.

14. The external blow-off apparatus of claim 11 wherein the adaptor body is a generally flat plate defining a thickness of the plate, a first planar surface adapted for bearing against the valve mounting flange, and a second planar surface adapted for receiving the recirculation valve, the first and second planar surfaces extending generally parallel to one another and spaced from one another by the thickness of the flat plate.

15. The external blow-off adaptor of claim 14, wherein:

the blow-off passage extends from the second planar surface into the plate and terminates in the wall of the adaptor body; and

the blow off vent extends from the blow-off passage and exits the plate between the first and second planar faces of the plate.

16. The external blow-off adaptor of claim 15, wherein the blow-off passage extends generally perpendicularly to the second planar surface into the thickness of the plate, and the blow-off vent extends transversely to the blow-off passage.

17. The external blow-off apparatus of claim 16, wherein the blow-off vent extends radially from the blow-off passage.

18. The external blow-off adaptor of claim 17, wherein the adaptor body further comprises a wall blocking fluid communication between the recirculation valve and the compressor outlet port of the flange, the wall thereby blocking internal recirculation between the compressor inlet and outlet ports, and directing a flow of air from the recirculation valve to the blow-off vent when the recirculation valve is operating in the recirculation mode.

19. A method for providing an external blow-off valve for a turbocharger compressor having a recirculation valve configured for attachment to a valve mounting flange defining a recirculation valve inlet port and a recirculation valve outlet port that are selectively connected to one another by the recirculation valve when the recirculation valve is operating in a recirculation mode, to thereby provide internal recirculation from a compressor outlet operatively connected in fluid communication with the recirculation valve inlet port to a compressor inlet operatively

connected in fluid communication with the recirculation valve inlet port, and disconnected from one another by the recirculation valve when recirculation valve is not operating in the recirculation mode, to thereby block internal recirculation between the compressor outlet port and the compressor inlet port, the method comprising installing an external blow off adaptor between recirculation valve and the valve mounting flange.

20. The method of claim 19, further comprising:

separating the recirculation valve from the valve flange;

inserting the external blow-off adaptor between the recirculation valve and the valve mounting flange; and

clamping the external blow-off adaptor between the recirculation valve and the valve mounting flange.